

Did You Hear That?

High-Tech Device Detects Weevils in Nursery Crops

Adult black vine weevil, *Otiorhynchus sulcatus*; actual size about 7 mm or 3/8 inch.



PEGGY GREB (K11135-1)

Like a reporter sticking a microphone up to the mouth of a celebrity, ARS entomologist James R. Fisher sticks a specially designed microphone in the pots of nursery crops to hear black vine weevils.

The nursery industry in Oregon is huge, raking in sales of more than \$600 million, with 80 percent of the crops shipped to other states. Black vine weevils want to eat away—literally—at that industry by munching on the roots of those crops.

“There is zero tolerance for these insects, with quarantines imposed by other states and buyers,” says Fisher, who works in the ARS Horticultural Crops Research Laboratory, in Corvallis, Oregon. If state inspectors find even one weevil, the shipment can’t be sold. The nursery industry spends more money (\$3 million) on controlling these weevils than on all other insect pests combined.

Nurseries hire pest scouts to hunt for black vine weevils in an effort to limit insecticide use. But the scouts can search only about 5 to 8 pots per hour. So Fisher teamed up with Richard W. Mankin, of ARS’s Center for Medical, Agricultural, and Veterinary Entomology in Gainesville, Florida, and Acoustic Emission Consulting (AEC) of Fair Oaks, California, to develop a portable listening device that can evaluate 15 to 25 pots per hour.

AEC and other corporations previously worked with ARS to listen in on non-root-feeding pests such as termites, ants,

and Asian longhorned beetles. But Fisher believes this new device will revolutionize detection of root-feeding pests like the weevil.

While technology to measure insect noises has been around since the early 1900s, it did not become reliable until the 1980s. This invention is one of the first that can easily be used in the field.

Previous versions weighed 15 pounds and could not be used in the rain. The new one is lighter, can filter unnecessary noise, and is more durable. Unlike other models, this one doesn’t need a professional technician to operate it. “The device is very user friendly,” says Fisher.

The person doing the listening wears headphones and places a wand-like device on a very large nail that has been placed in the root ball of the plant. Another handheld component then amplifies and measures the sounds. The weevil makes a distinctive clicking noise as its body vibrates off the soil.

Fisher is still working with the instrument to see which time of year is best to do the tests.—By **David Elstein**, ARS.

This research is part of Crop Protection and Quarantine, an ARS National Program (#304) described on the World Wide Web at www.nps.ars.usda.gov.

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PEGGY GREB (K11131-1)



Entomologist Jim Fisher uses a portable acoustic detector and amplifier (AED-2000) connected to a detection probe placed into a pot among the roots of a bird’s nest spruce, a popular woody ornamental.

PEGGY GREB (K11132-1)



Full-grown larva of black vine weevil, *Otiorhynchus sulcatus*; actual size about 6 mm or 1/4 inch.